Postdoc in Nanomaterial Synthesis from Ionic Liquids

Are you passionate about creating sustainable solutions through cutting-edge materials research?

The Department of Biological and Chemical Engineering at Aarhus University (Faculty of Technical Sciences) invites applications for a **3-year full-time postdoctoral position** in the *Intelligent Advanced Materials* group led by **Prof. Dr. Anja-Verena Mudring**.

This position is part of two ambitious projects funded by the **Villum Foundation** and the **Novo Nordisk Foundation**, exploring the **design, synthesis, and advanced characterization of nanomaterials** generated from **ionic liquids and deep eutectic solvents**. The goal is to unlock their potential in **next-generation green energy technologies**.

The successful candidate will join a highly collaborative and international research environment that values creativity, interdisciplinarity, and scientific excellence. The position will commence on **1 January 2026**, or as soon as possible thereafter.

Project Context
Chemical Engineering and iNANO, Aarhus University, in the field of nanomaterial synthesis from ionic liquids.

The Villum Investigator award allows Prof. Mudring to build on two previous, ERC funded research in the field of ionic liquids and nanomaterials. The project aims at taking research to the next level by elucidation how how ionic liquids and deep eutectic solvents influence the formation of nanomaterials in order to unlock the possibility of targeted synthesis and assembly of nanomaterials.

Nanomaterials have become indispensable for modern life. Many technologies depend critically on nanomaterials with engineered properties and structures. Technological borders could be pushed further if more powerful tools for the tailored synthesis of nanomaterials could become available. Here, ionic liquids (ILs, room temperature molten salts) and ther related class of deep eutectic solvents have the potential to become a true game changer. ILs, which can be built by a wide variety of cation-anion combinations with different functionalities, can act as the reaction medium, particle stabilizing and templating agent all-in-one, sometimes even as the reaction partner. This kind of nanomaterial synthesis is faster, safer, and more energy- and atom-efficient than comparable methods. It uses less toxic chemicals, omits the use of auxiliary substances such as stabilizers, and minimizes waste. Through coupling with unconventional synthetic routes (physical vapor deposition, microwaves, ultrasound) that take advantage of their unique properties, ILs become even more powerful in nanomaterials synthesis.

Read more at Ionic liquids and deep eutectics as a transformative platform for the synthesis of nanomaterials - Chemical Communications (RSC Publishing)

Job description
As a **Postdoctoral Researcher**, your position will be primarily research-based. You will contribute—both independently and in close collaboration with colleagues—to the Villum Foundation–funded research project by conducting **high-quality, internationally recognized research**. You will be working in a dynamic, collaborative environment with partners in Denmark and abroad.
Your main responsibilities will include:

- **Design and synthesis** of ionic liquids and deep eutectic solvents
- **Characterization** of purity and structure using NMR spectroscopy, elemental analysis, and vibrational spectroscopy
- **Bottom-up nanomaterials synthesis** from inorganic and organometallic precursors in ionic liquids/deep eutectic solvents, employing advanced techniques such as microwave-assisted and sonochemical methods
- **Top-down nanomaterials synthesis** via physical vapor deposition in ionic liquids
- **Comprehensive characterization** of nanomaterials using state-of-the-art diffraction and scattering techniques

Application Deadline:
29 October 2025

Faculty:
Faculty of Technical Sciences

Institute/Faculty:
Department of Biological and Chemical Engineering

Academic contact person:
Anja Verena Mudring
Professor
anja-verena.mudring@bce.au.dk

Vacant positions:
1

Hours per week:
37

Number of months:
36

Expected date of accession:
01/01/2026

- **Establishing structure–property relationships** to guide targeted materials design
- **Dissemination of research outcomes** through reports, peer-reviewed publications, and presentations at international conferences

Your profile

Applicants must hold a PhD in chemistry, medicinal chemistry, chemical engineering, materials science, or a related field, and demonstrate a strong track record of scientific excellence.

The ideal candidate will have:

- Documented experience in synthetic chemistry
- Preferably, a background in nanomaterial synthesis and characterization
- Additional experience with ionic liquids and/or deep eutectic solvents will be considered a strong advantage
- A record of publishing in reputable, peer-reviewed journals

We are looking for a candidate who is independent, reliable, and motivated, with strong communication and interpersonal skills. You should be comfortable working both individually and in a collaborative, international research environment.

Fluency in written and spoken English is required.

Who we are

The Institute of Biological and Chemical Engineering (BCE) has strong research sections in Environmental Engineering and Materials & Process Engineering. Close collaboration with our neighboring Departments (Biosciences, Food, Agroecology, Chemistry, Mechanical Engineering, Electrical & Computer Engineering, Molecular Biology & Genetics and iNano,) is a natural part of our culture.

The successful applicant will be working at the intelligent Advanced Materials unit in the field of Materials Science & Engineering with focus on Crystal Engineering and will produce and disseminate knowledge and research results. The intelligent Advanced Materials group headed by Prof. Dr. Anja-Verena Mudring is currently being built up with financial support of the Aarhus University Research, Villum, Novo Nordisk, Carlsberg, and Danish Independent Research foundations. Translation of results into solving relevant societal challenges and contributing to the Green Transition is a highly prioritized part of our work.

What we offer

- an internationally competitive research environment with new, state-of-the laboratories and equipment
- an exciting interdisciplinary environment with many national, international and industrial collaborators
- a work environment encouraging lively, open and critical discussion
- a workplace characterised by professionalism and a healthy life-work integrati

Place of work and area of employment

The place of work is Åbogade 40, 8200 Aarhus N, Denmark, and the area of employment is Aarhus University with related departments.

Contact information

For further information, please contact: Professor Anja Verena Mudring, anja-verena.mudring@bce.au.dk.

Deadline

Applications must be received no later than 29 October 2025.

Application procedure

Shortlisting is used. This means that after the deadline for applications – and with the assistance from the assessment committee chairman, and the appointment committee

if necessary, – the head of department selects the candidates to be evaluated. All applicants will be notified whether or not their applications have been sent to an expert assessment committee for evaluation. The selected applicants will be informed about the composition of the committee, and each applicant is given the opportunity to comment on the part of the assessment that concerns him/her self. Once the recruitment process is completed a final letter of rejection is sent to the deselected applicants.

Letter of reference

If you want a referee to upload a letter of reference on your behalf, please state the referee's contact information when you submit your application. We strongly recommend that you make an agreement with the person in question before you enter the referee's contact information, and that you ensure that the referee has enough time to write the letter of reference before the application deadline.
Unfortunately, it is not possible to ensure that letters of reference received after the application deadline will be taken into consideration.

If you wish to add a referee **after** you have submitted your application, you must send this person's details (name, job title, place of work, and email address) as well as the name of the position you have applied for to: HR.Nattech@au.dk

Formalities and salary range

Technical Sciences refers to the Ministerial Order on the Appointment of Academic Staff at Danish Universities under the Danish Ministry of Science, Technology and Innovation.

The application must be in English and include a curriculum vitae, degree certificate, a complete list of publications, a statement of future research plans and information about research activities, teaching portfolio and verified information on previous teaching experience (if any). Guidelines for applicants can be found here.

Appointment shall be in accordance with the collective labour agreement between the Danish Ministry of Taxation and the Danish Confederation of Professional Associations. Further information on qualification requirements and job content may be found in the Memorandum on Job Structure for Academic Staff at Danish Universities.

Salary depends on seniority as agreed between the Danish Ministry of Taxation and the Confederation of Professional Associations.

Aarhus University's ambition is to be an attractive and inspiring workplace for all and to foster a culture in which each individual has opportunities to thrive, achieve and develop. We view equality and diversity as assets, and we welcome all applicants.

Research activities will be evaluated in relation to actual research time. Thus, we encourage applicants to specify periods of leave without research activities, in order to be able to subtract these periods from the span of the scientific career during the evaluation of scientific productivity.

Aarhus University offers a broad variety of services for international researchers and accompanying families, including relocation service and career counselling to expat partners. Read more here. Please find more information about entering and working in Denmark here.

Aarhus University also offers a Junior Researcher Development Programme targeted at career development for postdocs at AU. You can read more about it here.

The application must be submitted via Aarhus University's recruitment system, which can be accessed under the job advertisement on Aarhus University's website.

Aarhus University

Aarhus University is an academically diverse and research-intensive university with a strong commitment to high-quality research and education and the development of society nationally and globally. The university offers an inspiring research and teaching environment to its 38,000 students (FTEs) and 8,300 employees, and has an annual revenues of EUR 935 million. Learn more at www.international.au.dk/